SEQUENCE LISTING

```
     <110> Københavns Universitet
           Louise Jørgensen
 5         Pamela Magistrado
           Thomas Lavstsen
           Ali Salanti
           Morten A. Nielsen
           Trine Staalsø
10         Lars Hviid
           Thor Theander
           Anja Jensen

     <120> COMPOUNDS USEFUL IN THE DIAGNOSIS AND
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     785                    790                    795                    800
     Thr Lys Asn His Thr Asn Asp Ser Arg Pro Asn Gly Glu Pro Cys Thr
              805                    810                    815
 30  Gly Lys Asp Lys Val Lys Asn Gly Phe Arg Leu Lys Ile Gly Thr Pro
              820                    825                    830
     Trp Thr Asn Ile Val Gln Lys Lys Lys Lys Ser Tyr Lys Asp Phe
              835                    840                    845
     Tyr Leu Pro Pro Arg Arg Gln His Met Cys Thr Ser Asn Leu Glu Asn  .
 35      850                    855                    860
     Leu Ser Thr Ser Ser Lys Gly Leu Ser Asn Gly Ser Phe Ala Ser His
     865                    870                    875                    880
     Ser Leu Leu Gly Asp Val Leu Leu Ala Ala Lys Phe Glu Ala Gln Lys
              885                    890                    895
 40  Ile Ile Leu Val Tyr Lys Asn Lys Asn Asn Ile Asn Ile Arg Lys Arg
              900                    905                    910
     Ile Thr Asp Pro Asn Asp Gln Ala Thr Val Cys Arg Ala Ile Arg Tyr
              915                    920                    925
     Ser Phe Ala Asp Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asn
 45      930                    935                    940
     Ile Asn Ser Asp Ala Lys Asp Leu Gln Asp Arg Leu Glu Lys Ile Phe
     945                    950                    955                    960
     Lys Thr Ile Asn Glu Lys Leu Pro Asn Glu Ile Gln Lys Arg Tyr Thr
              965                    970                    975
 50  Asn Arg Glu Asn Lys His Leu Asp Leu Arg Ser Asp Trp Trp Glu Ala
              980                    985                    990
     Asn Arg His Gln Val Trp Arg Ala Met Lys Cys Ala Thr Lys Gly Ile
              995                    1000                   1005
     Ser Asn Asn Asn Cys Asn Gly Ile Pro Ile Glu Asp Tyr Ile Pro Gln
 55      1010                   1015                   1020
     Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Lys Gln
     1025                   1030                   1035                   1040
     Ser Gln Glu Tyr Glu Lys Leu Glu Glu Lys Cys Gly Met Cys Thr Gly
                 1045                   1050                   1055
```

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   Lys Gly Gln Gly Asp Gly Lys Asp Cys Thr Gln Lys Asp Lys Glu Cys
             1060                1065                1070
   Ser Pro Cys Lys Lys Ala Cys Asp Ala Tyr Lys Lys Glu Ile Glu Lys
         1075                1080                1085
 5 Trp Glu Lys Gln Trp Lys Thr Val Ser Ala Ile Tyr Gln Ile Leu Tyr
             1090                1095                1100
   Ala Lys Ala Arg Ile Val Ala Ser Asn Gly Gly Pro Gly Tyr Tyr Asn
   1105                1110                1115                1120
   Thr Glu Val Gln Lys Lys Asp Arg Ser Val Tyr Asp Phe Leu Tyr Glu
10                  1125                1130                1135
   Leu His Leu Gln Asn Gly Gly Lys Lys Gly Pro Pro Pro Ala Thr His
             1140                1145                1150
   Pro Tyr Lys Ser Val Asn Thr Arg Asp Lys Arg Asp Ala Thr Asp Asp
             1155                1160                1165
15 Thr Thr Pro Thr Val Tyr Ser Thr Ala Ala Gly Tyr Val His Gln Glu
             1170                1175                1180
   Ala His Ile Gly Asp Cys Lys Glu Gln His Val Phe Cys Asp Asn Asn
   1185                1190                1195                1200
   Gly Asn Lys Glu Lys Tyr Ala Phe Lys Asn Pro Pro Asn Val Tyr Val
20                  1205                1210                1215
   Glu Ala Cys Lys Cys Met Thr Arg Glu Ala Pro Pro Pro Thr Thr
             1220                1225                1230
   Pro Ser Thr Pro Asn Pro Cys Ala Glu Thr Gly Gly Val His Thr Ile
             1235                1240                1245
25 Lys Thr Val Thr Asp Val Ala Lys Ile Leu Gln Gly Glu Ala Asn Glu
             1250                1255                1260
   Thr Met Leu Lys Asn Ser Ser Asn Gly Asn Asp Lys Asp Glu Ser Lys
   1265                1270                1275                1280
   Leu Lys Gly Lys Ala Glu Glu Gly Asp Tyr Ser Arg Gly Gly Thr Pro
30                  1285                1290                1295
   Ser Asp Phe Asn Asn Asn Leu Cys Gly Ile Thr Gln Lys His Ser Asn
             1300                1305                1310
   Ala His Asn Asp Ser Gln Gln Pro Cys Tyr Gly Lys Asp Gln Lys Arg
             1315                1320                1325
35 Phe Asn Val Gly Thr Glu Trp Ser Phe Lys Asp Asn His Arg Lys Arg
             1330                1335                1340
   Thr His Pro Glu Ala Tyr Met Pro Pro Arg Arg Glu His Ile Cys Thr
   1345                1350                1355                1360
   Ser Asn Leu Glu Tyr Leu Ile His Lys Arg Lys Lys Pro Ile Ile Glu
40                  1365                1370                1375
   Gly Asp Pro Asn Lys Ile Ile His Ser Leu Leu Gly Asp Val Leu Leu
             1380                1385                1390
   Ala Ala Lys Tyr Glu Ala Glu Asn Ile Lys Lys Leu Tyr Glu Glu Asn
             1395                1400                1405
45 Asn Asn Arg Lys Asp Gln Glu Gly Ile Cys Arg Ala Met Lys Tyr Ser
             1410                1415                1420
   Phe Ala Asp Ile Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Ile Glu
   1425                1430                1435                1440
   Asn Asn Asp Ala Lys Arg Leu Gln Thr Asn Leu Lys Glu Ile Phe Thr
50                  1445                1450                1455
   Lys Ile Lys Glu Lys Thr Gly Gly Thr Thr Tyr Asn Glu Asp Asn Asp
             1460                1465                1470
   Pro Tyr Leu Lys Leu Arg Ala Asp Trp Trp Glu Ala Asn Arg Ala Lys
             1475                1480                1485
55 Val Trp Lys Ala Met Lys Cys Lys Thr Asn Gly Val Asp Ile Thr Cys
             1490                1495                1500
   Asp Ser Asp His Thr Pro Leu Asp Asp Tyr Ile Pro Gln Arg Leu Arg
   1505                1510                1515                1520
   Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Ala Gln Ser Gln Glu
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                    1525                  1530                    1535
      Tyr Lys Lys Leu Glu Glu Lys Cys Ser Gln Cys Lys Ser Lys Gly Lys
                1540                  1545           ·        1550
      Gly Gly Asn Glu Cys Tyr Arg Glu Thr Lys Glu Cys Asn Asp Cys Lys
  5         1555                  1560                  1565
      Gln Ala Cys Glu Glu Tyr Lys Arg Lys Ile Lys Thr Trp Ala Asp Gln
         1570                  1575                  1580
      Trp Lys Val Ile Ser Asn Lys Tyr Glu Asp Leu Tyr Lys Lys Ala Gln
      1585                  1590                  1595              1600
 10   Asn Pro Thr Asn Ala Val Leu Lys Asp Asn Lys Asp Glu Lys Asp Lys
                    1605                  1610                  1615
      Asn Val Ile Asp Phe Leu Thr Gln Leu Gln Lys Ala Asn Asn Gly Glu
                1620                  1625                  1630
      Lys Thr Gly Val His Thr Val Tyr Ser Thr Ala Ala Gly Tyr Ile His
 15         1635                  1640                  1645
      Gln Glu Ala Arg Thr Arg Glu Cys Gln Glu Gln Arg Glu Phe Cys Asp
         1650                  1655                  1660
      Lys Lys Asn Gly Ile Asp Asn Thr Ser Tyr Ala Phe Lys Asp Pro Pro
      1665                  1670                  1675              1680
 20   His Gly Tyr Ala Thr Ala Cys Asp Cys Ile Asn Arg Ser Gln Thr Glu
                    1685                  1690                  1695
      Glu Pro Lys Lys Lys Glu Glu Asn Val Glu Ser Ala Cys Lys Ile Val
                1700                  1705                  1710
      Glu Glu Val Leu Ser Lys Pro Arg Asp Lys Thr Thr Gly Gly Ile Asp
 25         1715                  1720·                 1725
      His Cys Asn Pro Lys Tyr Tyr Pro Arg Lys Glu Asn Tyr Pro Gly Trp
          1730                  1735                  1740
      Asn Cys Thr Pro Gly Gln Phe Lys Ser Gly His Ala Gly Ala Cys Met
      1745                  1750                  1755              1760
 30   Pro Pro Arg Arg Ile Lys Leu Cys Val Ile Asn Leu Gln Tyr Leu Asn
                    1765                  1770                  1775
      Glu Lys Lys Ser Pro Glu Glu Leu Arg Lys Ala Phe Ile Gln Cys Ala
                1780                  1785                  1790
      Ala Ile Glu Thr Tyr Trp Leu Trp Gln Lys Tyr Lys Lys Asp Lys Asn
 35         1795                  1800                  1805
      Gly Gly Val Ala Gln Ala Lys Leu Asn Ser Gly Thr Ile Pro Asp Asp
          1810                  1815                  1820
      Phe Lys Arg Gln Met Phe Tyr Thr Phe Gly Asp Tyr Arg Asp Leu Cys
      1825                  1830                  1835              1840
 40   Leu Asp Thr Asp Ile Ser Ser Lys Ala Asp Thr Ser Thr Gly Val Gly
                    1845                  1850                  1855
      Lys Val Lys Ile Asn Ile Asp Ser Val Phe Gln Lys Ile Asp Ile Thr
                1860                  1865                  1870
      Asn Val Glu Gln Arg Lys Pro Trp Trp Gly Lys Asn Ala Glu Ala Ile
 45         1875                  1880                  1885
      Trp Asp Gly Met Leu Cys Ala Leu Ser Tyr Asn Thr Thr Asn Lys Asn
          1890                  1895                  1900
      Met Asp Tyr Asn Ala His Thr Lys Leu Asn Pro Thr Tyr Gly Tyr Asn
      1905                  1910                  1915              1920
 50   Ala Ile Lys Ser Glu Leu Glu Asp Phe Val Asn Arg Pro Gln Phe Leu
                    1925                  1930                  1935
      Arg Trp Phe Thr Glu Trp Ser Asp Glu Phe Cys Thr Glu Arg Ser Ile
          1940                  1945                  1950
      Lys Ile Lys Glu Leu Glu Thr Lys Cys Asn Asp Cys Thr Val Ser Glu
 55         1955                  1960                  1965
      Ser Gly Thr Ser Asp Ala Thr Gly Asn Lys Thr Cys Asp Asp Lys Asp
          1970                  1975                  1980
      Lys Cys Asp Glu Cys Lys Arg Ala Cys Thr Thr Tyr Lys Thr Trp Leu
      1985                  1990                  1995              2000
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    Lys Asn Trp Lys Thr Gln Tyr Lys Thr Gln Ser Lys Lys Tyr Phe Asp
                2005              2010              2015
    Asp Lys Arg Lys Glu Leu Tyr Lys Ser Ile Asp Asp Val Ala Ser Ser
                2020              2025              2030
 5  Thr Gln Ala Tyr Gln Tyr Leu His Ala Gln Leu Lys Lys Leu Cys Gly
                2035              2040              2045
    Asn Ala Asp Cys Lys Cys Met Asp Gly Glu Ser Lys Glu Thr Thr Gly
                2050              2055              2060
    Gln Pro Asp Asn Ser His Asp Ser His Met Pro Ala Ser Leu Asp Asp
10  2065              2070              2075              2080
    Glu Pro Glu Glu Val Asn Gly Lys Cys Asn Cys Lys Val Lys His Arg
                2085              2090              2095
    Pro Gln Pro Pro Leu Ala Leu Pro Pro Ala Pro Ser Gly Pro Pro
                2100              2105              2110
15  Ala Glu Asp Gln Ile Glu His Asp Asn Arg Gly Arg Ser Glu Arg Gly
                2115              2120              2125
    Asp Gln Gly Pro Leu Pro Ala Arg Pro Pro Pro Pro Gln Ala Ala
                2130              2135              2140
    Gln Pro Pro Gln Pro Lys Pro Lys Arg Thr Gly Glu Gly Leu Gly Arg
20  2145              2150              2155              2160
    Asn Leu Pro Pro Ala Asp Arg Asn Thr Asn Leu Ser Asp Ser Glu Glu
                2165              2170              2175
    Glu Asp Asp Glu Asp Asp Asp Glu Val Gln Glu Glu Glu Thr Pro
                2180              2185              2190
25  Pro Ser Glu Ala Glu Glu Gly Glu Gly His Val Glu Thr Glu Glu Glu
                2195              2200              2205
    Thr Lys Pro Val Lys Glu Lys Thr Glu Gly Ala Gly Ala Thr Glu Val
                2210              2215              2220
    Thr Lys Gln Gly Ser Ala Pro Thr Ala Thr Thr Pro Thr Val Glu Asp
30  2225              2230              2235              2240
    Ile Cys Ala Thr Val Ala Lys Ala Leu Lys Gly Asp Lys Ser Leu Asn
                2245              2250              2255
    Ala Ala Cys Ala Leu Lys Tyr Gly Lys Asn Asn Ser Arg Leu Gly Trp
                2260              2265              2270
35  Lys Cys Ile Pro Thr Ser Gly Asp Lys Thr Asp Thr Ser Glu Asn Gly
                2275              2280              2285
    Ala Pro Arg Arg Ala Arg Ser Ala His Gly Gly Lys Ser Asp Ser Glu
                2290              2295              2300
    Lys Gly Ser Ile Cys Val Pro Pro Arg Arg Arg Arg Leu Tyr Ile Lys
40  2305              2310              2315              2320
    Lys Ile Val Asp Trp Ala Glu Ser Gln Ser Lys Thr Val Thr Ser Val
                2325              2330              2335
    Asn Gly Asp Gly Asn Gly Ser Gln Glu Val Val Ser Val Asn Gly Ala
                2340              2345              2350
45  Ser Glu Ser Gly Gly Ser Gly Ser Gly Thr Glu Ser Gln Ala Ser Asp
                2355              2360              2365
    Val Ser Gln Gly Asn Gly Ala Ser Thr Ser Pro Gln Val Ala Leu Leu
                2370              2375              2380
    His Ala Phe Val Lys Ser Ala Ala Ile Glu Thr Phe Phe Ala Trp His
50  2385              2390              2395              2400
    Lys Tyr Lys Val Asp Lys Glu Ile Glu Glu Lys Glu Lys Gln Ala Ala
                2405              2410              2415
    Gln Asn His Leu Val Gln Arg Lys Thr Ser Glu Asn Pro Gln Lys Lys
                2420              2425              2430
55  Leu Glu Gly Gly Glu Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr
                2435              2440              2445
    Thr Leu Gly Asp Tyr Arg Asp Ile Leu Val Gly Asp Lys Thr Met Ile
                2450              2455              2460
    Glu Ala Leu Glu Lys Ser Gly Asp Thr Lys Ile Glu Asp Ile Ser Glu
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     2465                    2470                    2475                    2480
     Lys Ile Pro Lys Ile Leu Asp Gly Glu Asn Asn Lys Ala Ala Gly Gly
                        2485                    2490        ·          2495
     Gly Pro Lys Gln Pro Asn Ser Gly Lys Thr Pro Gln Glu Trp Trp Lys
  5                  2500                    2505                    2510
     Glu Asn Ala Lys His Ile Trp His Gly Met Ile Cys Ala Leu Thr Tyr
                   2515                    2520                    2525
     Asn Thr Asp Ser Asn Gly Lys Asp Lys Lys Ile Gln Gln Val Lys Ala
                2530                    2535                    2540
 10  Thr Asp Asn Thr Asp Leu Phe Gln Lys Leu Lys Lys Asp Asn Asp Tyr
     2545                    2550                    2555                    2560
     Glu Thr Val Ser Phe Gly Ala Ser Gly Thr Gly Ala Lys Ser Asn Asp
                        2565                    2570                    2575
     Asp Thr Lys Leu Lys Asn Phe Val Val Arg Pro Thr Tyr Phe Arg Trp
 15                  2580                    2585                    2590
     Leu Glu Glu Trp Gly Glu Glu Phe Cys Arg Lys Gln Lys His Lys Leu
                   2595                    2600                    2605
     Tyr Ile Ile Lys Lys Asp Cys Arg Asp Asn Lys Phe Cys Ser Gly Asp
                2610                    2615                    2620
 20  Gly Leu Arg Cys Asp Glu Lys Val Pro Asp Lys Lys Asp Ile Phe Lys
     2625                    2630                    2635                    2640
     His Phe Asp Cys Pro Ser Cys Ala Arg His Cys Arg Ser Tyr Arg Lys
                        2645                    2650                    2655
     Trp Ile Glu Arg Lys Lys Thr Glu Tyr Glu Lys Gln Glu Ser Ala Tyr
 25                  2660                    2665                    2670
     Ser Lys Gln Lys Ser Asn Tyr Val Asn Gly Ser Asn Gly Asp Gly Gly
                   2675                    2680                    2685
     Asn Asn Asn Asp Lys Glu Phe Tyr Thr Lys Leu Glu Thr Cys Thr Lys
                2690                    2695                    2700
 30  Ala Thr Asn Phe Leu Glu Ser Leu Lys Gly Gln Cys Ile Gly Asn Asn
     2705                    2710                    2715                    2720
     Asn Gly Gly Thr Asp Ile Lys Phe Ser Asn Thr Asn Ile Thr Phe Gly
                        2725                    2730                    2735
     Ser Ala Glu Asp Cys Lys Pro Cys Ser Glu Phe Lys Val Asn Cys Glu
 35                  2740                    2745                    2750
     Asn Gly Ser Cys Gly Ser Ala Lys Gln Lys Asp Cys Pro Asn Asn Thr
                   2755                    2760                    2765
     Ile Thr Ser Gln Asn Ile Lys Gly Leu Thr Asp Gln Val Asp Met Arg
                2770                    2775                    2780
 40  Val Ser Asp Asn Thr Glu Ser Gly Phe Glu Gly Asp Leu Gly Ile Cys
     2785                    2790                    2795                    2800
     Gln Gly Ala Gly Ile Phe Lys Gly Ile Arg Lys Asp Glu Trp Lys Cys
                        2805                    2810                    2815
     Gly Asp Phe Cys Gly Ile Asp Ile Cys Thr Leu Glu Lys Thr Asn Asn
 45                  2820                    2825                    2830
     Gly Lys Glu Ser Asp Lys Lys Tyr Ile Ile Met Lys Glu Phe Val Lys
                   2835                    2840                    2845
     Arg Trp Leu Glu Tyr Phe Phe Glu Asp Tyr Asn Arg Ile Gln Lys Lys
                2850                    2855                    2860
 50  Leu Lys Thr Cys Lys Glu Asn Gly Lys Gly Ser Thr Cys Ile Arg Ser
     2865                    2870                    2875                    2880
     Cys Val Asp Glu Trp Ile Lys Leu Lys Lys Asp Glu Trp Gln Lys Ile
                        2885                    2890                    2895
     Asn Ser Asn Tyr Leu Asp Gln Asn Thr Lys Glu Asn Pro Glu Gly Asn
 55                  2900                    2905                    2910
     Asn Leu Ser Ser Phe Leu Glu Asp Gly Pro Phe Lys Asn Glu Val Asp
                   2915                    2920                    2925
     Lys Ala Ile Lys Pro Cys Gly Asn Leu Thr Asp Phe Lys Lys Ser Lys
                2930                    2935                    2940
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    Lys Cys Asn Gly Thr Ser Arg Ser Gly Asn Ser Glu Glu Ser Thr Lys
    2945                2950                2955                2960
    Tyr Asp Gly Val Ile Cys Leu Leu Asp Asn Leu Lys Asn Ile Ile Lys
                    2965                2970                2975
 5  Thr Cys Gln Asn Val Pro Ser Gly Lys Pro Asp Thr Pro Cys Gln Lys
                2980                2985                2990
    Ser Pro Ala Pro Val Gly Asp Asp Asp Pro Leu Glu Glu Glu Asn
                2995                3000                3005
    Pro Val Thr Gln Pro Asn Ile Cys Pro Gln Thr Ser Val Glu Glu Lys
10     3010                3015                3020
    Lys Lys Glu Glu Glu Glu Lys Cys Asp Glu Lys Glu Glu Glu Glu Glu
    3025                3030                3035                3040
    Lys Glu Glu Glu Lys Asp Lys Gly Asp Glu Glu Val Lys Glu Glu Glu
                3045                3050                3055
15  Lys Asp Lys Gly Asp Glu Glu Glu Glu Ala Glu Glu Glu Glu Glu Glu
                3060                3065                3070
    Glu Glu Glu Thr Asp Ser His Ile Tyr Glu Asp Tyr Ser Asp Ser Asp
                3075                3080                3085
    Ala Glu Glu Asp Asp Glu Asp Glu Ala Val Thr Glu Ser Leu Ser Pro
20     3090                3095                3100
    Ser Glu Ser Gln Pro Lys Arg Leu Leu Arg Glu Phe Pro Ser Pro Glu
    3105                3110                3115                3120
    Leu Lys Asn Ala Met Leu Phe Ser Thr Ile Leu Trp Met Val Gly Ile
                3125                3130                3135
25  Gly Phe Ala Ala Phe Thr Tyr Phe Phe Leu Lys Lys Lys Pro Lys Ser
                3140                3145                3150
    Pro Val Asp Leu Leu Arg Val Leu Asp Ile His Lys Gly Asp Tyr Gly
                3155                3160                3165
    Thr Pro Thr Pro Lys Ser Lys Asn Arg Tyr Ile Pro Tyr Val Ser Asp
30     3170                3175                3180
    Thr Tyr Lys Gly Lys Thr Tyr Leu Tyr Val Glu Gly Asp Thr Asp Glu
    3185                3190                3195                3200
    Glu Lys Tyr Met Phe Leu Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu
                3205                3210                3215
35  Ser Glu Tyr Glu Glu Leu Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser
                3220                3225                3230
    Pro Lys Tyr Lys Thr Leu Ile Glu Val Val Leu Glu Pro Ser Lys Ser
                3235                3240                3245
    Asp Gly Asn Thr Pro Gly Lys Gly Asp Gly Asn Thr Leu Gly Asp Asp
40     3250                3255                3260
    Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn Glu Leu
    3265                3270                3275                3280
    Lys Gln Asp Phe Val Ser Gln Tyr Ile Gln Ser Arg Leu Pro Met Asp
                3285                3290                3295
45  Val Pro Gln Tyr Asp Val Ser Thr Glu Ser Pro Met Asn Ile Gly Gly
                3300                3305                3310
    Asn Val Leu Asp Asp Gly Met Asp Glu Lys Pro Phe Ile Thr Ser Ile
                3315                3320                3325
    His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile His
50     3330                3335                3340
    Met Ser Thr Asn Thr Asn Asn Asp Ile Pro Lys Tyr Val Ser Asn Asn
    3345                3350                3355                3360
    Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Thr Leu Ser Asp Asn Lys
                3365                3370                3375
55  His Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu
                3380                3385                3390
    Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Ser Val Ala Lys
                3395                3400                3405
    Asn Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys
```

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           3410              3415              3420
   Trp Leu Asp Arg His Arg Asp Ile Cys Glu Asn Trp Gly Lys Lys Glu
   3425              3430              3435           ·       3440
   Asp Ile Leu Asn Lys Leu Asn Glu Gln Trp Asn Lys Asp Asn Asp Gly
 5                3445              3450              3455
   Gly Asp Ile Pro Asn Asp Asn Lys Lys Leu Asn Thr Asp Val Ser Ile
              3460              3465              3470
   Gln Ile Asp Met Asp Glu Thr Lys Gly Lys Lys Glu Phe Ser Asn Met
          3475              3480              3485
10 Asp Thr Ile Leu Asp Asp Met Glu Asp Asp Ile Tyr Tyr Asp Val Asn
          3490              3495              3500
   Asp Glu Asn Pro Ser Val Asp Asp Ile Pro Met Asp His Asn Lys Val
   3505              3510              3515              3520
   Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn Thr
                   3525              3530              3535
15 Ser Asn Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp Asn
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35 aaaagacatg gaaagttttt gaagggaaat ttgagagatg ccaaattta tcatgattat 180
   tctaagttaa gagacatacc tagaagtccc tgtgatcttg atttttggtt tcatacgaat 240
   gtttggaggg acaaagcata tgaaagagat ccttgttatg gcagacaagc aaaaaataat 300
   tacaatttgg aaggagcagt atgtacgaat agtaaaataa aaggtaatga aaacaagata 360
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<212> PRT
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<400> 4
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            20                  25                  30
Lys Arg Asp Val Ser Asn Asn Ala Lys Arg His Gly Lys Val Leu Lys
        35                  40                  45
Gly Asn Leu Arg Asp Ala Lys Phe Tyr His Asp Tyr Ser Lys Leu Arg
    50                  55                  60
Asp Ile Pro Arg Ser Pro Cys Asp Leu Asp Phe Trp Phe His Thr Asn
65                  70                  75                  80
Val Trp Arg Asp Lys Ala Tyr Glu Arg Asp Pro Cys Tyr Gly Arg Gln
                85                  90                  95
Ala Lys Asn Asn Tyr Asn Leu Glu Gly Ala Val Cys Thr Asn Ser Lys
            100                 105                 110
Ile Lys Gly Asn Glu Asn Lys Ile Asn Asp Ile Gly Ala Cys Ala Pro
        115                 120                 125
Tyr Arg Arg Arg Asn Ile Cys Asp Tyr Asn Leu Glu His Leu Asn Glu
    130                 135                 140
Arg Asn Val Leu Asn Thr His Asp Leu Leu Gly Asn Val Leu Val Met
145                 150                 155                 160
Ala Lys Arg Glu Gly Glu Ser Ile Val Glu Lys His Pro Asn Arg Gly
                165                 170                 175
Ser Ser Glu Val Cys Ile Ala Leu Ala Arg Ser Phe Ala Asp Ile Gly
            180                 185                 190
Asp Ile Leu Arg Gly Lys Asp Met Tyr Val Gly Tyr Asp Glu Lys Glu
        195                 200                 205
Lys Asn Arg Arg Lys Gln Leu Glu Asn Lys Leu Lys Asp Ile Phe Asp
    210                 215                 220
Asn Ile Tyr Lys Asp Leu Thr Lys Lys Lys Gly Arg Asn Gly Lys Lys
225                 230                 235                 240
Ser Ala Leu Gln Glu Arg Tyr Asn Asp Pro Lys Gly Asp Phe Phe Gln
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            260                 265                 270
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        275                 280                 285
Gly Val Thr Lys Ser Phe Thr Asn Pro Lys Cys Gly His Gly Asp Asn
    290                 295                 300
Glu Val Leu Thr Asn Leu Asp Tyr Val Pro Gln Phe Leu Arg Trp Phe
305                 310                 315                 320
Thr Glu Trp Ala Glu Glu Phe Cys Arg Ile Arg Lys Ile Lys Leu Gly
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Ser Gly Asp Gly Tyr Asp Cys Thr Lys Thr Asp Ile Ser Arg Asn Ile
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       Asn Lys Tyr Thr Lys Glu Ile Glu Lys Leu Lys Asp Asn Ser Lys Ser
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       Asn Tyr Asp Lys Asn Phe Tyr Leu Thr Leu Thr Lys Lys Tyr Gly Ser
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       Asn Thr Ile Glu Asp Lys Ile Asp Phe Asn Lys Ala Asn Gln Thr Phe
                  450                    455                    460
       Thr Ser Ser Lys Phe Cys Gly Ala Cys Pro Phe Tyr Gly Val Lys Cys
 15    465                    470                    475                    480
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                  485                    490                    495
       Asn Lys Val Asp Ser Thr His Thr Thr Glu Gln Pro Thr Ala Ile Asp
                  500                    505                    510
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                  515                    520                    525
       Asp Cys Lys Lys Tyr Gly Leu Phe Lys Gly Met Arg Lys Gln Ala Trp
                  530                    535                    540
       Lys Cys Gln Tyr Ile Asn Pro Tyr Asp Glu Cys Lys Leu Ser Pro Phe
 25    545                    550                    555                    560
       Val Lys Asp Ile Asp Val Asp Asp Arg Ile Leu Phe Lys Val Leu Phe
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       Glu Arg Trp Leu Lys Tyr Phe Ile Gln Asp Phe Asn Asn Val Lys Asp
                  580                    585                    590
 30    Lys Ile Asn Arg Cys Thr Lys Phe Glu Lys Gly Lys Asp Asn Thr Cys
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       Ile Lys Gly Cys Lys His Lys Cys Glu Cys Val Glu Lys Trp Ile Lys
           610                    615                    620
       Ile Lys Glu Ala Glu Trp Lys Lys Ile Asn Gln His Tyr Asn Gln Gln
 35    625                    630                    635                    640
       Lys Lys His Tyr Thr Tyr Ser Val Pro Arg Trp Val Asn Ser Tyr Leu
                  645                    650                    655
       Thr His Gln His Phe Ser Ser Asp Phe Ile Asn Ala Leu Glu Ala Phe
                  660                    665                    670
 40    Lys Asn Ile Arg Gly Leu Glu Asn Leu Lys Glu Cys Ser Ser Asp Thr
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       Cys Lys Ile Glu Lys Ile Arg Thr Ile Asp Asp Leu Ile Lys Glu
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       Leu Ile Ser Lys Leu Lys Asp Lys Cys Ala Met Cys Lys Asn Gln His
 45    705                    710                    715                    720
       Lys Ala Thr Lys Gly Lys Glu Cys Cys Gly Lys Leu Pro Lys Thr Leu
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       Asn Asp Gln Asp Asp Glu Glu Asp Glu Glu Tyr Glu Ala Pro Pro Pro
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                  755                    760                    765
       Gln Lys Val Arg Lys Ile Arg Ser Val Arg Arg Val Pro Lys Arg Met
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       Gln Lys Gln Ala Ser Val Arg Val Pro Arg Ala Arg Gln Gly Gly Glu
 55    785                    790                    795                    800
       Arg Glu Gln Val Val Lys Asn Gly Arg Gln Asp His His Leu Gln Arg
                  805                    810                    815
       Val Leu Leu Val Gly Glu Ala Glu Ala Glu Glu Pro Glu Thr Ala Glu
                  820                    825                    830
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                835             840             845
        Pro Pro Pro Ala Ala Thr Thr Pro Gly Val Lys Pro Pro Cys Asp Ile
            850             855             860
    5   Val Glu Lys His Phe Lys Asp Lys His Asp Asn Thr Gly Ala Ile Asp
        865             870             875             880
        His Cys Asn Pro Lys Lys Asp Tyr Pro Pro Trp Lys Asn Asp Lys Ser
                    885             890             895
        Leu Val Asp Glu Asp Gly Val Tyr Met Pro Pro Arg Arg Gln Lys Leu
    10              900             905             910
        Cys Val Ile Asn Leu Glu His Phe Lys Glu Asn Thr Ser Asp Asp Leu
                915             920             925
        Arg Glu Ala Phe Ile Lys Cys Ala Ala Ala Glu Thr Tyr Leu Leu Trp
                930             935             940
    15  Gln Lys Tyr Lys Glu Asp Asn Asn Gly Gly Glu Asp Leu Gln Asn Gln
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        Leu Lys Ser Gly Lys Ile Pro Glu Asp Phe Lys Arg Gln Met Phe Tyr
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    20              980             985             990
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        Ser Thr Tyr Asn Tyr Asp Thr Ile Lys Asn Asn Leu Glu Asp Phe Ala
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        Asn Arg Pro Gln Phe Leu Arg Trp Phe Ile Glu Trp Ser Asp Glu Phe
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        Cys Arg Glu Arg Lys Lys Lys Glu Glu Lys Val Gly Ser Ala Cys Lys
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    35  Asn Asp Tyr Glu Gly Cys Ala Asn Thr Lys Asp Asn Gly Asn Gly Asn
        1105            1110            1115            1120
        Cys Val Asn Ala Cys Asn Ala Tyr Lys Lys Tyr Ile Thr Asp Lys Lys
                    1125            1130            1135
        Glu Gln Tyr Glu Lys Gln Ala Lys Lys Phe Asp Ile Asp Lys Ser Gln
    40              1140            1145            1150
        Asn Lys Pro Gly Tyr Glu Asp Tyr Ser Gly Lys Lys Ala Ser Glu Tyr
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        Leu Lys Glu Lys Cys Ile Asn Ser Ser Cys Asp Tyr Met Leu Lys Leu
            1170            1175            1180
    45  Lys Asp Asn Ser Asn Tyr Trp Glu Lys Pro His Thr Thr Tyr Asp Asp
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        Val Asp Lys Thr Leu Gly Asp Lys Thr Ser Lys Ser Tyr Ala Glu Gly
    50              1220            1225            1230
        Cys Lys Trp Lys Tyr Gly Lys Met Pro Leu Gly Leu Gly Trp Leu Cys
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        Asn Asp Lys Glu Gly Glu Lys Gly Lys Glu Asp Gly Leu Cys Ile Pro
            1250            1255            1260
    55  Pro Arg Arg Lys Arg Leu Tyr Val Lys Asp Leu Glu Thr Phe Ser Asp
        1265            1270            1275            1280
        His Thr Thr Val Gly Leu Arg Glu Ala Phe Ile Lys Cys Ala Ala Val
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        Glu Thr Phe Phe Ala Trp His Glu Phe Thr Lys Glu Lys Glu Arg Glu
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        Leu Ala Asp Tyr Arg Asp Ile Leu Phe Gly Asn Asn Ile Gly Ile Gly
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    10  Asn Asp Met Gly Lys Val Lys Ser Asn Ile Asp Lys Val Phe Ala Asn
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        Ser Ser Gly Lys Thr Pro Thr Ala Lys Lys Thr Thr Pro Lys Glu Trp
                1395                1400                1405
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    20  Ser Ser Asp Asn Asn Thr Asn Leu Ser Lys Phe Thr Glu Arg Pro Pro
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        Phe Phe Arg Trp Phe Gln Glu Trp Gly Glu Glu Phe Cys Arg Lys Lys
                1475                1480                1485
        Lys Ile Lys Ile Asp Lys Ile Glu Lys Glu Cys Arg Gly Pro Tyr Gly
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        Arg Asn His Cys Asp Gly Asp Gly Phe Asp Cys Ser Glu Ile Gly Pro
        1505                1510                1515                1520
        Asn Glu Asn Gly Ser Phe Ala Ile Phe Lys Cys Pro Ser Cys Ala Ile
                1525                1530                1535
    30  Ser Cys Arg Ser Tyr Lys Thr Trp Ile Asn Thr Lys Lys Asp Glu Phe
                    1540                1545                1550
        Lys Lys Gln Glu Lys Leu Tyr Asn Lys Glu Ile Lys Asp Asn Lys Ser
                1555                1560                1565
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        Asp Tyr Lys Ser Val Asp Ser Phe Leu Lys Lys Leu Lys Glu Gly Pro
        1585                1590                1595                1600
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        Lys Tyr Pro Gly Asp Leu Asn Gly Val Cys Glu Asn Ser Ser Ile Phe
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        Asp Ile Cys Thr Pro Asn Lys Thr Thr Gly Asp Ile His Asp Lys Gln
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        Asn Ala Pro Ile Arg Val Leu Phe Lys Arg Trp Ile Glu Asn Phe Leu
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        Lys Asp His Asn Lys Ile Lys Asp Lys Ile Ser Leu Cys Ile Asn Asn
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    1825                1830                1835                1840
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    Lys Asn Glu Arg Asp Asp Ser Met Gly Lys Glu Ser Cys Lys Thr Leu
              1875                1880                1885
 15 Pro Glu Pro Thr Asp Asp Pro Gln Thr Asp Ser Asp Thr His Asp Thr
              1890                1895                1900
    Pro Asp Ile Pro Pro Gly Asp Val Ala Pro Thr Phe Cys Asn Val Pro
    1905                1910                1915                1920
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 20                1925                1930                1935
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              1940                1945                1950
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              1955                1960                1965
 25 Ser Val Leu Arg Ala Asp Ala Ser Lys Gly Glu Tyr Lys His Glu Gly
              1970                1975                1980
    Asn Pro Asp Asp Leu Lys His Asn Met Cys Asn Ile Thr Lys Glu His
    1985                1990                1995                2000
    Thr Asn Tyr Gln Lys Arg Gly Gly Tyr Asn Tyr Arg Gly Pro Cys Thr
 30                2005                2010                2015
    Gly Lys Gly Asn Gly Lys Asp Thr Arg Phe Val Ile Gly Thr Ile Trp
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    Leu Val Thr Ile Phe Gly Lys Ile Lys Glu Glu Ile Pro Asp Ile Lys
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    Lys Lys Tyr Ser Ser Glu Asn Pro Pro Tyr Thr Thr Leu Arg Glu His
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              2210                2215                2220
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30 2945               2950               2955               2960
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        Phe Glu Lys Ile Asn Asn Gly Leu Lys Lys Ile Gly Ile Asn Asp Tyr
 20     225             230             235             240
        Asn Asp Ile Ser Gly Asn Tyr Tyr Lys Leu Arg Glu Ala Trp Trp Thr
                        245             250             255
        Ala Asn Arg Asp Gln Val Trp Lys Ala Ile Thr Cys Arg Ala Pro Asn
                        260             265             270
 25     Gly Ala Asn Tyr Phe Arg Lys Gly Leu Asp Gly Lys Ile Ile Phe Ser
                        275             280             285
        Asp Asn Gly Pro Cys Gly Arg Lys Glu Leu Ile Val Pro Thr Tyr Leu
                        290             295             300
        Asp Tyr Val Pro Gln Phe Leu Arg Trp Leu Asn Glu Trp Ser Glu Glu
 30     305             310             315             320
        Phe Cys Arg Ile Lys Asn Ile Lys Ile Gly Asn Ile Lys Lys Ser Cys
                        325             330             335
        Thr Gly Glu Ser Asn Asn Lys His Cys Ser Arg Glu Gly Tyr Asp Cys
                        340             345             350
 35     Asn Lys Thr Asn Leu Arg Leu Asn Glu Ile Phe Met Asp Leu Glu Cys
                        355             360             365
        Pro Arg Cys Ala Asp Asp Cys Lys Ser Tyr Glu Thr Trp Val Glu Lys
                        370             375             380
        Lys Lys Lys Glu Phe Asn Lys Gln Lys Lys Lys Tyr Glu Lys Glu Val
 40     385             390             395             400
        Asp Ala Thr Gln Asn Asn Asp Asn Asn Glu Asn Gly Ile Tyr Asn Lys
                        405             410             415
        Lys Phe Tyr Asp Glu Leu Lys Ser Ser Tyr Lys Glu Val Asn Ser Phe
                        420             425             430
 45     Phe Glu Leu Leu Asn Lys Gly Pro Ile Cys Glu His Ile Asp Lys Lys
                        435             440             445
        Ile Pro Met Asp Tyr Asn Asn Thr Glu Lys Thr Phe Ser Arg Ser Glu
                        450             455             460
        Tyr Cys Lys Ser Cys Pro Ile Thr Asp Ile Leu Cys Asp Asp Asn Glu
 50     465             470             475             480
        Cys Lys Thr Ile Asn Glu Phe Lys Cys Arg Glu Ile Lys Ser Met Pro
                        485             490             495
        Asn Ile Arg Lys Asn Glu Asn Glu Thr Pro Ile Asp Ile Asp Ile Leu
                        500             505             510
 55     Val Asn Val Asn Asn Lys Lys Val Ile Thr His Asp Leu Lys Asn Asn
                        515             520             525
        Tyr Glu Asn Cys Asp Leu Phe Lys Lys Leu Gly Glu Gln Lys Trp Lys
                        530             535             540
        Cys Lys Tyr Lys Cys Tyr Leu Asp Val Cys Glu Pro Arg Asn Leu Asp
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         545                  550                  555                  560
     Ser Asn Ile Tyr Asn Glu Arg Tyr Ile Ser Ile Lys Val Leu Phe Lys
                          565                  570                  575
     Arg Trp Leu Glu Tyr Phe Leu Glu Asp Tyr Asn Lys Leu Lys Glu Lys
  5                      580                  585                  590
     Leu Asn Pro Cys Met Tyr Asn Val Gln Glu Ile Val Cys Ile Asn Glu
                      595                  600                  605
     Cys Lys Gln Asn Cys Glu Cys Val Glu Lys Trp Ile Lys Glu Lys Arg
                  610                  615                  620
 10  Glu Glu Trp Lys Lys Ile Lys Asp Arg Tyr Val Gln Gln Tyr Glu Ser
         625                  630                  635                  640
     Lys Asp Glu Asp Val Ser Ser Lys Leu Lys Lys Phe Leu Lys Gln Glu
                      645                  650                  655
     Leu Phe Thr Asn Tyr Val Lys Asn Ala Leu Asp Lys Asp Glu Thr Leu
 15                  660                  665                  670
     Asp Ser Met Lys Glu Ser Thr Glu Cys Ile Asp Pro Asn Lys Pro Lys
                  675                  680                  685
     Gly Lys Pro Cys Asn Asn Asn Asp Val Ile Asn Ile Leu Leu Asn Arg
                  690                  695                  700
 20  Leu Glu Lys Gln Ile Asp Asn Cys Lys Lys Lys His Glu Glu Lys Gly
         705                  710                  715                  720
     Glu Lys Pro Cys Val Asp Ile Pro Lys Leu Leu Asn Asp Glu Asp Glu
                      725                  730                  735
     Asp Glu Asp Asp Asp Glu Thr Pro Arg Ala His Asn Pro Cys Val Asp
 25                  740                  745                  750
     Lys Asn Asp Ser Gln Pro Thr Lys Thr Val Ser Tyr Ile Ala Arg Gln
                  755                  760                  765
     Met His Arg Arg Ala Lys Ala Gln Met Thr Lys Asn Ser Val Val Asp
             770                  775                  780
 30  Gly Asp Asn Lys Leu Glu Gly Asp Ile Phe Lys Val Thr Phe Arg Asn
         785                  790                  795                  800
     Gly Gly Val Gly Lys Asn Leu Asn Gly Asp Ile Cys Lys Ile Asp Lys
                      805                  810                  815
     Thr Tyr Ser Asn Asp Ser Arg Gly Thr Pro Thr Asp Gly Pro Cys Glu
 35                  820                  825                  830
     Gly Lys Gly Asp Arg Phe Lys Ile Gly Thr Asp Trp Gln Gly Asp Ser
                  835                  840                  845
     Phe Val Asn Pro Gln Tyr Arg Gly Ile Tyr Met Pro Pro Arg Arg Gln
             850                  855                  860
 40  His Phe Cys Thr Ser Asn Leu Glu Lys Leu Asp Val Ser Arg Val Ile
         865                  870                  875                  880
     Arg Asn Gly Asn Ala Ser Asn Ser Leu Leu Gly Asp Val Leu Leu Ala
                      885                  890                  895
     Ala Lys Tyr Glu Ala Glu Arg Thr Lys Asn His Tyr Val Ser Lys Lys
 45                  900                  905                  910
     Glu Glu His Ser Glu Ala Cys Arg Ala Val Arg Tyr Ser Phe Ala Asp
                  915                  920                  925
     Leu Gly Asp Ile Ile Arg Gly Lys Asp Met Trp Asp Lys Asn His Gly
             930                  935                  940
 50  Glu Lys Lys Thr Gln Glu Asn Leu Glu Arg Ile Phe Ala Lys Ile Lys
         945                  950                  955                  960
     Glu Gln Leu Leu Asn Ser Ser Ile Lys Asp Lys Tyr Lys Asp Asp Asp
                      965                  970                  975
     Lys Ala Thr Pro Lys Tyr Lys Gln Leu Arg Glu Asp Trp Trp Glu Ala
 55                  980                  985                  990
     Asn Arg Ser Gln Val Trp Glu Ala Met Gln Cys Pro Pro Lys Asn Gly
                  995                  1000                 1005
     Thr Phe Pro Cys Lys Ser Asp His Thr Pro Leu His Asp Tyr Ile Pro
                  1010                 1015                 1020
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Gln Arg Leu Arg Trp Met Thr Glu Trp Ala Glu Trp Tyr Cys Lys Glu
1025   1030   1035   1040
Gln Ser Arg Leu Tyr Gly Glu Leu Val Glu Thr Cys Gly Lys Cys Met
            1045   1050   1055
5 His Lys Gly Lys Cys Lys Gln Gly Asn Gly His Cys Val Thr Cys Lys
            1060   1065   1070
Pro Ala Cys Glu Lys Tyr Lys Lys Phe Ile Asn Thr Trp Gln Pro Gln
        1075   1080   1085
Trp Lys Gln Met Glu Gln Lys Tyr Ser Gln Leu Tyr Glu Glu Ala Lys
10   1090   1095   1100
Lys Tyr Asn Asp Ser Ser Arg Lys Asp Thr Thr Asn Lys Asp Asp Tyr
1105   1110   1115   1120
Val Leu Gln Phe Leu Asn Lys Leu Leu Thr Gln Asn Lys Gly Asn Lys
            1125   1130   1135
15 Thr Tyr Asp Thr Ala Glu Gly Tyr Val His Gln Glu Ala His Ile Ser
            1140   1145   1150
Asp Cys Gln Lys Gln Thr Gln Phe Cys Lys Lys Arg Asn Gly Glu Ile
        1155   1160   1165
Pro Ser Ser Asp Thr Glu Thr Asp Asn Asn Tyr Ala Phe Arg Pro Gln
20   1170   1175   1180
Pro His Asp His Asp Glu Val Cys Glu Cys Asn Thr Arg Gln Lys Thr
1185   1190   1195   1200
Lys Val Arg Lys Lys Lys Lys Lys Val Asp Ala Cys Glu Met Ala Lys
            1205   1210   1215
25 Thr Leu Leu His Asn Asn Asp Gly Thr Ile Arg Ile Gly Gln Cys Lys
            1220   1225   1230
Arg Lys Asp Glu Gly Asn Ala Glu Tyr Pro Lys Trp Asp Cys Asn Ser
        1235   1240   1245
Gln Ile His Thr Thr His Asn Gly Ala Cys Met Pro Pro Arg Arg Gln
30   1250   1255   1260
Lys Leu Cys Val Tyr Phe Phe Ala Asn Pro Ser Gln Ile Gly Ser Ile
1265   1270   1275   1280
Asn Lys Gln Asp Asn Leu Arg Lys Ala Phe Ile Ile Ser Ala Ala Ala
            1285   1290   1295
35 Glu Thr Phe Arg Ser Trp Gln Tyr Tyr Lys Ser Lys Asn Gly Gly Glu
            1300   1305   1310
Asn Leu Gln Thr Gln Leu Lys Asp Gly Thr Ile Pro Asp Asp Phe Lys
        1315   1320   1325
Arg Gln Met Phe Tyr Thr Tyr Gly Asp Tyr Arg Asp Phe Leu Phe Gly
40   1330   1335   1340
Thr Asp Ile Ser Lys Gly Leu Gly Glu Gly Thr Ala Leu Glu Lys Gln
1345   1350   1355   1360
Ile Asn Ile Leu Phe Pro Asn Gly Val Arg Lys Ile Pro Asn Glu Lys
            1365   1370   1375
45 Thr Arg Glu Lys Trp Trp Thr Asp His Gly Pro Glu Ile Trp Lys Gly
            1380   1385   1390
Met Leu Cys Ala Leu Thr Asn Gly Leu Ser Glu Ser Glu Lys Lys Thr
        1395   1400   1405
Lys Ile Phe Asp Asp Tyr Ser His Asp Lys Val Asn Gln Ser Lys Asn
50   1410   1415   1420
Gly Asn Pro Ser Leu Glu Asp Phe Ala Lys Lys Pro Gln Phe Phe Arg
1425   1430   1435   1440
Trp Phe Ile Glu Trp Ser Asp Glu Phe Cys Arg Glu Arg Lys Lys Lys
            1445   1450   1455
55 Glu Glu Glu Val Glu Arg Asp Cys Lys Asp Glu Tyr Glu Gly Cys Glu
            1460   1465   1470
Lys Glu Lys Asn Gly Lys Cys Val Thr Ala Cys Lys Ala Tyr Lys Glu
        1475   1480   1485
Tyr Ile Thr Asn Lys Lys Glu Glu Tyr Asp Ser Gln Lys Gly Lys Phe

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          1490                1495                1500
     Asp Val Glu Lys Thr Glu Lys Lys Gln Gly Tyr Glu Asp Tyr Ser Glu
     1505                1510          .          1515                1520
 5   Lys Gln Ala Ser Glu Tyr Leu Lys Glu Lys Cys Ile Lys Ser Ser Cys
                    1525                1530                1535
     Asn Cys Met Lys Lys Val Thr Glu Ile Ser Asn Tyr Trp Thr Asn Pro
               1540                1545                1550
     His Lys Thr Tyr Asp Thr Glu Asn Leu Gly Ile Lys Cys Glu Cys Pro
               1555                1560                1565
10   Pro Ser Pro Cys Thr Ile Val Asp Gly Ile Leu Ser Pro Gln Asn Ser
          1570                1575                1580
     Ser Ser Tyr Ala Glu Gly Cys Lys Trp Lys Tyr Gly Lys Met Ser Gln
     1585                1590                1595                1600
     Gly Gly Thr Glu Trp Asp Cys Ser Lys Lys Ser Gly Gly Glu Gly Gly
15                  1605                1610                1615
     Asn Glu Asp Gly Asp Val Val Cys Ile Pro Pro Arg Arg Arg Arg Leu
               1620                1625                1630
     Tyr Val Lys Asn Leu Gln Asp Leu Thr Gly Glu Glu Ser Leu Val Asp
               1635                1640                1645
20   Leu Arg Lys Ala Phe Ile Lys Cys Ala Ala Ile Glu Thr Phe Phe Ala
          1650                1655                1660
     Trp His Glu Phe Lys Lys Glu Lys Glu Arg Glu Glu Lys Glu Lys Asn
     1665        .          1670                1675                1680
     Glu Gln Asp Val Gln Tyr Lys Ser Ser Val Leu Glu Asn Leu Gln Lys
25                  1685                1690    .          1695
     Gln Leu Lys Asn Gly Glu Ile Asp Asp Glu Phe Lys Arg Gln Met Phe
               1700                1705                1710
     Tyr Thr Phe Ala Asp Tyr Arg Asp Ile Cys Leu Gly Lys Asp Ile Gly
               1715                1720                1725
30   Asn Asp Val Asp Gly Ile Asn Glu Lys Ile Asp Thr Ile Leu Gln Lys
          1730                1735                1740
     Asn Gly Lys Pro Asn Asn Ile Glu Glu Tyr Lys Lys Trp Trp Gln Lys
     1745                1750                1755                1760
     His Gly His Glu Ile Trp Glu Gly Met Leu Cys Ala Leu Ser Tyr Asn
35                  1765                1770                1775
     Thr Glu Thr Lys Glu Met Asp Lys Glu Leu Arg Asn Lys Leu Thr Glu
               1780                1785                1790
     Gln Lys Asn Gly Asn Lys Asn Thr Tyr Asp Thr Val Thr Ile Ser Gly
               1795                1800                1805
40   Gly Pro Ile Gly Asn Thr Lys Leu Glu Lys Phe Ala Ser Arg Pro Pro
          1810                1815                1820
     Phe Phe Arg Trp Leu Glu Glu Trp Ala Asp Glu Phe Cys Arg Lys Arg
     1825                1830                1835                1840
     Thr His Lys Leu Glu Lys Ile Gln Asn Glu Cys Lys Gly Val Ser Gly
45                  1845                1850                1855
     Thr Asn Gln Cys Asp Asp Asp Gly Phe Asp Cys Asp Glu Met Cys Pro
               1860                1865                1870
     Lys Lys Asp Gly Ser Phe Glu Thr Phe Lys Cys Leu Ser Cys Ala Lys
               1875                1880                1885
50   Ser Cys Arg Phe Tyr Lys Lys Trp Ile Ser Arg Lys Lys Glu Glu Phe
          1890                1895                1900
     Asp Lys Gln Ser Lys Lys Tyr Glu Asn Glu Ile Asp Asp Val Lys His
     1905                1910                1915                1920
     Asn Ser Asp Asn Ile Tyr Gly Lys Asp Phe Leu Glu Thr Leu Asp Gln
55                  1925                1930                1935
     Gln Tyr Lys Ser Val Glu Leu Phe Leu Glu Lys Val Lys Gly Pro Cys
               1940                1945                1950
     Ser Ile Asn Asn Asn Asn Glu Glu Cys Lys Ile Asp Phe Asn Lys Pro
          1955                1960                1965
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     Lys Asp Thr Phe Gly His Ala Lys Asn Cys Gly Pro Cys Ser Glu Ile
         1970              1975              1980
     Arg Phe Lys Cys Ile Glu Asp Asn Ser Asn Trp Val Thr Thr Asn Thr
     1985              1990              1995              2000
  5  Cys Asn Lys Thr Thr Phe Lys Phe Thr Glu Asp Asn Lys Asp Thr Lys
                   2005              2010              2015
     Glu Asp Ser Glu Gln Leu Gly Met Leu Ile Ser Asp Asn Thr Val Gln
              2020              2025              2030
     Asn Phe Ala Asp Gly Leu Gln Asn Asp Cys Lys Asp Ala Asp Ile Phe
 10          2035              2040              2045
     Lys Gly Leu Arg Lys Asp Gln Trp Ser Cys Gly Tyr Phe Cys Asn Leu
         2050              2055              2060
     Asp Ile Cys Ser Leu Lys Thr Ser His Gly Glu Asn Asn Tyr Lys Gln
     2065              2070              2075              2080
 15  Asn Ile Leu Ile Arg Ala Leu Phe Lys Arg Trp Leu Glu His Phe Leu
                   2085              2090              2095
     Glu Asp Tyr Asn Lys Ile Asn Asp Lys Ile Ser His Cys Met Lys Asn
              2100              2105              2110
     Gly Glu Gly Ser Thr Cys Ile Lys Gly Cys Glu Ile Lys Cys Asn Cys
 20          2115              2120              2125
     Val Ser Asn Trp Ile Lys Lys Lys Thr Leu Glu Trp Glu Ile Val Arg
         2130              2135              2140
     Asp Arg Phe Phe Lys Gln Tyr Asn Val Asp Ser Glu Lys Ser Phe Thr
     2145              2150              2155              2160
 25  Val Lys Ser Phe Leu Glu Gln Ala Pro Phe Asp Ser Asp Val Gln Lys
                   2165              2170              2175
     Ala Ile Lys Pro Phe Glu Lys Leu Arg Asp Phe Glu Asp Ser Ile Val
              2180              2185              2190
     Cys Asn Gly Thr Thr Ser Ala Arg Lys Glu Lys Gly Thr Glu Lys Asp
 30          2195              2200              2205
     Val Val Ile Cys Leu Leu Asp Lys Leu Gln Lys Gln Ile Glu Thr Cys
     2210              2215              2220
     Gln Thr Lys His Lys Glu Thr Ser Gly Asn Thr Cys Ser Pro Pro Pro
     2225              2230              2235              2240
 35  Asn Pro Asp Thr Gln Thr Asp Thr Pro Leu Pro Leu Glu Ser Phe Pro
                   2245              2250              2255
     Pro Pro Phe Cys Asn Val Pro Pro Asn Pro Cys Gly Asp Lys Asp Ala
              2260              2265              2270
     Thr Asn Val Val Gly Val Glu Val Leu Ala Lys Glu Met Gln Glu Ala
 40          2275              2280              2285
     Ala His Lys Ser Met Leu Ser Arg Ser Ala Val Asp Ser Gly Lys Gly
         2290              2295              2300
     Asp Lys Gly Glu Ser Ser Ser Gly Lys Ser Ser Leu Glu Gly Asp Ile
     2305              2310              2315              2320
 45  Ser Leu Ala Glu Phe Lys Asn Gly Phe Asn Pro Ser Gly Leu Lys Asn
                   2325              2330              2335
     Val Cys Gln Ile Thr Glu Lys His Ser Tyr Ala Asn Gly Ala Ser Lys
              2340              2345              2350
     Asp Pro Cys Asn Gly Lys Gly Asn Gly Lys Asp Gln Arg Phe Lys Ile
 50          2355              2360              2365
     Glu Thr Gln Trp Lys Asp Thr Gly Lys Ser Gly Lys His Val Asp Val
         2370              2375              2380
     Tyr Leu Pro Pro Arg Arg Glu His Ile Cys Thr Ser Asn Leu Glu Tyr
     2385              2390              2395              2400
 55  Leu Leu Lys Gly Asn Ser Asp Gln Ile Met Lys Val Gly Asn Asn Lys
                   2405              2410              2415
     Ile Asn His Ser Phe Leu Gly Glu Val Leu Leu Ala Ala Lys Tyr Glu
              2420              2425              2430
     Ala Glu Phe Ile Lys Thr Asn Tyr Thr Arg Leu Asn Gly Gln Asn Asp
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                 2435                2440                2445
     Asn Gly Ala Lys Cys Arg Ala Met Lys Tyr Ser Phe Ala Asp Ile Gly
          2450                2455             2460
     Asp Ile Val Arg Gly Arg Asp Leu Trp Glu His Asn Asp Phe Lys Lys
  5  2465                2470                2475                2480
     Leu Glu Arg Asp Leu Val Lys Ile Phe Gly Lys Ile Lys Glu Gly Ile
               2485                2490                2495
     Thr Asp Glu Thr Thr Lys Lys Gln Tyr Glu Lys Asp Asp Thr Asp Asn
               2500                2505                2510
 10  Lys Gln Leu Arg Cys Asp Trp Trp Glu Ala Asn Arg Asp Gln Val Trp
          2515                2520                2525
     Glu Ala Met Gln Cys Lys Thr Thr Ile Pro Pro Val Thr Thr Ser Cys
          2530                2535                2540
     Asp Thr Thr Thr Val Thr Pro Leu Val Asp Tyr Ile Pro Gln Arg Leu
 15  2545                2550                2555                2560
     Arg Trp Met Met Glu Trp Ala Glu Trp Tyr Cys Lys Tyr Gln Ser Lys
               2565                2570                2575
     Ala Tyr Ser Glu Leu Arg Lys Gly Cys Glu Asp Cys Arg Ser Trp Lys
               2580                2585                2590
 20  Cys Met Lys Gly Asp Ser Lys Cys Glu Asn Cys Thr Lys Ala Cys Lys
          2595                2600                2605
     Asp Tyr Asn Ser Lys Ile Glu Pro Trp Lys Gln Gln Trp Thr Lys Ile
          2610                2615                2620
     Lys Glu Lys Tyr Glu Glu Leu Tyr Lys Lys Ala Gln Asn Ser Asp Thr
 25  2625                2630                2635                2640
     Ser Asn Ser Gly Thr Thr Tyr Pro Lys Asp Glu Lys Asp Val Val Ser
               2645                2650                2655
     Phe Leu Ser Lys Leu His Glu Lys Asn Lys Asp Asn Lys Ile Tyr Tyr
               2660                2665                2670
 30  Thr Ala Ala Gly Tyr Ile His Gln Gln Ala Lys Tyr Leu Asp Cys Thr
          2675                2680                2685
     Gln Gln Thr His Phe Cys Asp Lys Lys Asn Gly Glu Thr Leu Pro Ser
          2690                2695                2700
     Gly Arg Asp Asn Asp Lys Tyr Ala Phe Lys Lys Pro Pro Lys Lys Tyr
 35  2705                2710                2715                2720
     Glu Arg Ala Cys Lys Cys His Glu Lys Gln Glu Pro Pro Pro Pro Lys
               2725                2730                2735
     Val Pro Glu Asp Ser Glu Asp Asp Arg Glu Arg Ser Glu Pro Gly Glu
               2740                2745                2750
 40  Asp Ala Leu Pro Val Leu Pro Pro Glu Glu Ile Glu Gln Glu Glu Glu
          2755                2760                2765
     Pro Glu Glu Thr Ser Val Asp Thr Thr Gln Asp Glu Glu Glu Pro Ala
          2770                2775                2780
     Ser Glu Gly Gly Gly Pro Ser Gly Ser Pro Thr Glu Glu Ser Gly Glu
 45  2785                2790                2795                2800
     Pro Arg Glu Asn Ser Asp Ser Ser Asp Pro Lys Pro Asp Gln Asn Pro
               2805                2810                2815
     Glu Ala Asn Pro Glu Gln Thr Pro Ile Leu Lys Pro Glu Glu Glu Ala
               2820                2825                2830
 50  Pro Pro Lys Ser Lys Pro Pro Asp Gly Asp Arg Gly Val Gly Arg Ser
          2835                2840                2845
     Leu Gly Pro Thr Pro Arg Ser Glu Val Glu Pro Glu Glu Ser Glu Asn
          2850                2855                2860
     Glu Asp Val Glu Asp Glu Asp Asp Glu Glu Glu Glu Asp Pro Asp
 55  2865                2870                2875                2880
     Asp Asp Pro Glu Ala Glu Ser Glu Glu Glu Asp Glu Asp His Gly Gly
               2885                2890                2895
     Gln Glu Ala Glu Ala Val Pro Pro Gln Pro Gln Ala Pro Ala Pro Leu
               2900                2905                2910
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Pro Pro Pro Pro Pro Pro Leu Pro Pro Leu Lys Thr Ala Leu Met Ser
        2915   2920   2925

Ser Thr Ile Met Trp Ser Val Gly Ile Gly Phe Ala Ala Ile Ser Tyr
    2930   2935   2940

5 Phe Leu Leu Lys Lys Lys Pro Lys Ser Pro Val Asp Leu Ile Arg Val
  2945   2950   2955   2960

Ile Asp Ile His Lys Gly Asp Tyr Gly Ile Pro Thr Leu Glu Ser Lys
            2965   2970   2975

Asn Arg Tyr Ile Pro Tyr Val Ser Asp Thr Tyr Lys Gly Lys Thr Tyr
10   2980   2985   2990

Ile Tyr Met Glu Gly Asp Thr Ser Gly Asp Glu Lys Tyr Gly Phe Met
        2995   3000   3005

Ser Asp Thr Thr Asp Ile Thr Ser Ser Glu Ser Glu Tyr Glu Glu Leu
    3010   3015   3020

15 Asp Ile Asn Asp Ile Tyr Val Pro Gly Ser Pro Lys Tyr Lys Thr Leu
   3025   3030   3035   3040

Ile Glu Val Val Leu Glu Pro Ser Lys Ser Asn Gly Asn Thr Leu Gly
        3045   3050   3055

Asp Asp Met Val Pro Thr Thr Asn Thr Phe Thr Asp Glu Glu Trp Asn
20   3060   3065   3070

Glu Leu Lys His Asp Phe Ile Ser Gln Tyr Ile Gln Ser Glu Pro Leu
    3075   3080   3085

Asn Val Pro Gln Tyr Asp Val Leu Lys Glu Leu Pro Met Asn Ile Val
    3090   3095   3100

25 Gly Asn Val Leu Asp Asp Gly Ile Asn Glu Lys Pro Phe Ile Thr Ser
   3105   3110   3115   3120

Ile His Asp Arg Asp Leu Asn Ser Gly Glu Glu Ile Ser Tyr Asn Ile
        3125   3130   3135

Asn Met Ser Thr Asn Ser Met Asp Asp Pro Lys Tyr Val Ser Asn Asn
30   3140   3145   3150

Val Tyr Ser Gly Ile Asp Leu Ile Asn Asp Ser Leu Ser Gly Gly Lys
        3155   3160   3165

Pro Ile Asp Ile Tyr Asp Glu Val Leu Lys Arg Lys Glu Asn Glu Leu
    3170   3175   3180

35 Phe Gly Thr Asn Tyr Lys Lys Asn Thr Ser Asn Asn Asn Val Ala Lys
   3185   3190   3195   3200

Leu Thr Asn Ser Asp Pro Ile Met Asn Gln Leu Asp Leu Leu His Lys
        3205   3210   3215

Trp Leu Asp Arg His Arg Asp Met Cys Glu Met Trp Asn Asn Lys Glu
40   3220   3225   3230

Glu Val Leu Asp Lys Leu Lys Glu Gln Trp Asn Lys Asp Asn Asp Gly
        3235   3240   3245

Gly Asp Ile Ser Ser Asp Ser Asn Lys Arg Leu Asn Thr Asp Val Ser
    3250   3255   3260

45 Ile Glu Ile Asp Met Asp Asp Pro Lys Gly Lys Lys Glu Phe Ser Asn
   3265   3270   3275   3280

Met Asp Thr Ile Leu Asp Asn Ile Glu Asp Asp Ile Tyr Tyr Asp Val
        3285   3290   3295

Asn Asp Glu Asn Pro Ser Val Asn Asp Ile Pro Met Asp His Asn Lys
50   3300   3305   3310

Val Asp Val Pro Lys Lys Val His Val Glu Met Lys Ile Leu Asn Asn
    3315   3320   3325

Thr Ser Thr Gly Ser Leu Glu Gln Gln Phe Pro Ile Ser Asp Val Trp
    3330   3335   3340

55 Asn Ile
   3345